Space Weather Forecast

Issued on Monday, 31 October 2022 at 12:57 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1/Minor Storms days 1 and 4 (31st Oct and 3rd Nov).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been low over the last 24 hours, with only minor common class flares observed. There are three numbered sunspot regions on the visible disc. AR3135, is the largest region with well developed leading and trailing spots. AR3131 has simplified to become a large single spot. AR3133 close to centre disc is small and continues to fade. No Earth-directed coronal mass ejections have been observed.

Solar Wind / Geomagnetic Activity: The solar wind has remained slightly elevated, with a slight declining trend. This is indicative of the waning fast wind of coronal hole 37, which we have been connected to in recent days. Total interplanetary magnetic field strength was weak, with the north-south component varying weakly. Geomagnetic activity was Quiet to Unsettled (Kp 2-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to continue Low or Very Low, with a slight chance of isolated moderate class flares.

Solar Wind / Geomagnetic Activity: No Earth-directed coronal mass ejections are forecast. The Earth is currently under the influence of the high speed stream from a positive coronal hole. Later on day 1 (31st), Earth will likely transition into another coronal hole fast wind, with similar speeds expected. Earth will then likely transit out of this fast wind early on day 3 (2nd) with a likely decline in wind speeds before another fast wind arrives probably late on day 4 (3rd). Geomagnetic activity will likely be Quiet to Unsettled (Kp 2-3) throughout the period, with a chance of Active or G1/Minor Storm intervals (Kp 4-5) late on day 1 (31st) or late on day 4 (3rd) due to the coronal hole fast wind arrivals.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is forecast to persist at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	20	20	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	15	20	20
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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